If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match. The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are available by contacting the ESSHQ Procedures Coordinator, Bldg. 911A

C-A OPERATIONS PROCEDURES MANUAL

15.3.3.4 Siemens MG Set Megger Tests

(Booster/AGS Ring Power Supply Systems Group Procedure EPS-S-004)

Note: This document was formerly a C-A Group Procedure. The content of the group procedure was reviewed by the Technical Supervisor. All approvals and/or issue dates of the original group procedure are maintained for present use.

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

M. Bannon

Booster/AGS Ring Power Supply Systems
Group Procedure EPS-S-004
Revision 00

15.3.3.4 Siemens MG Set Megger Tests

1. Purpose

This procedure is to determine the integrity of the electrical insulation of the motor or generator rotors and stators.

2. Responsibilities

2.1 No personnel shall be allowed in the area during this test. A sign shall be placed on the MG Room doors stating Megger/Hipot Test of MG St is under way. If test is being performed from downstairs one man is to be upstairs as a safety watch as well as a second man running the test. Communication between the two men must be used. (Radio communication preferred)

2.2 When meggering/hipotting the motor --- CB-52 and CB-52B or FDS for CB-52B must be LOTO. When meggering/hipotting the generator --- CB-52G must be LOTO or the links removed from the generator output to CB-52G. Also in cubicle L5 in basement the PT's must be isolated from the output bus by removing the bolt which connects the PT's primary to the AC output bus of the generator then slide a piece of G10 material between connections to insure isolation.

3. Prerequisites

3.1 Two people trained in "Working Hot" and electrical safety shall perform the test.

3.2 The personnel shall have read this procedure and understand the test they are to perform.

3.3 Equipment and safety equipment needed to perform this test

1) High voltage gloves
2) Safety glasses
3) Grounding stick
4) Evershed coffin (biddle) megger 5000vdc model # 1404075) or equivalent.
5) Temp/humidity meter.

4. Procedure for motor testing

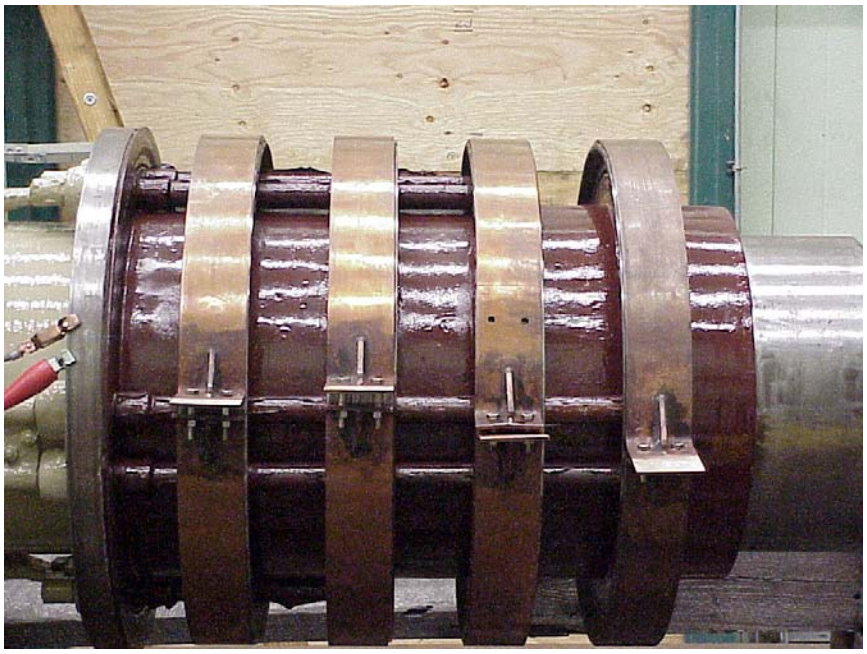
4.1 To perform the motor rotor resistance check we have 4 copper rings which must have their surfaces clean with a buffing wheel before starting to insure a good connection will be made to the motor rotor slip rings when these copper rings are bolted to them.

4.2 Bolt the rings onto motor rotor at 4 locations – u,n,v,w then using the low resistance biddle meter take the following resistance measurements and

record on data sheet. (u-n,v-n,w-n) compare them to previous test and compare results. (readings should be approx. 6.67 milliohms)

MOTOR ROTOR SLIP RINGS

U N V W



4.3 To perform the motor stator resistance check. This will be done from downstairs in RKl17 (18R) fingers. Attach biddle low resistance meter to a-b, b-c then c-a and record resistance. Compare them to previous test and compare results (readings should be approx. 150 milliohms)

4.4 Megger check the motor rotor at 2500 VDC with all rings shorted together for 10 minutes and record resistance measurements on test data sheet after each minute. Note: Record temp and humidity when performing test.

4.5 Megger check the motor stator at 2500 VDC with all phases shorted together for 10 minutes and record resistance measurements on test data sheet after each minute. Note: record temp and humidity when performing test.

RK L17 IN BASEMENT
LEFT YEL BUS=A

MIDDLE GRN BUS = B

RIGHT PURPLE BUS=C

5. Procedure for Generator Testing

5.1 To perform the generator rotor resistance check using the low resistance Biddle meter, take the generator exciter rings resistance measurements and record on data sheet. Compare results to previous test results (reading should be approx. Milliohms).

5.2 To perform the generator stator resistance check. This will be done from downstairs in generator pit. Note connections x, y, z are jumpered together in pit. Attach Biddle low resistance meter to x-u, y-v & z-w and record resistance. Compare them to previous test and compare results.

5.3 Megger check the generator rotor(exciter rings) at 2500 VDC with both rings shorted together for 10 minutes, and record resistance measurements on test data sheet after each minute. Note: Record temp and humidity when performing test. Compare results from the previous data taken and look for any discrepancies if any are noted, notify supervisor or engineer in charge.

5.4 Megger check the generator stator at 2500 VDC with all phases shorted together for 10 minutes, and record resistance measurements on test data sheet after each minute. Note: Record temp and humidity when performing test. Compare results from the previous data taken and look for any discrepancies if any are noted notify supervisor or engineer in charge.

6. Procedure for Checking Pedestals To Ground Checks

6.1 This procedure is done while assembling the MG Set.

6.2 When the pedestals are in place and installing shims, hardware, and plumbing, keep a fluke 77 meter attached to pedestal at all times and keep and eye on the reading to ground (pedestal are suppose to be isolated from ground) after pedestal is torque to the base and all plumbing is in place and the fluke-77 meter reading is good. Megger @ 100vdc to make sure pedestal is not grounded.

SIEMENS MOTOR – GENERATOR TEST

DATE:_____ BY:_____

Motor Rotor (Biddle low resistance measurement)

U-N _____milliohms

V-N _____milliohms

W-N _____milliohms

Motor Stator (Biddle low resistance measurement) taken from RK 18R

A-B _____milliohms

B-C _____milliohms

C-A _____milliohms

Motor Rotor Megger Test @ 2500VDC

TEMP_____ HUMIDITY_____

FOR	0 sec			
	1 min			
	2 min			
	3 min			
	4 min			
	5 min			
	6 min			
	7 min			
	8 min			
	9 min			
	10 min			

Motor Stator Megger Test @ 2500 VDC all Phases Shorted Together

TEMP_____ HUMIDITY_____

FOR	0 sec			
	1 min			
	2 min			
	3 min			
	4 min			
	5 min			
	6 min			
	7 min			
	8 min			
	9 min			
	10 min			

SIEMENS MOTOR – GENERATOR TEST

Date:_____ By:_____

Generator Exciter Field winding @ Rings (Biddle low resistance measurement)

_____milliohms

Generator Stator (Biddle low resistance measurement)
Note: x,y,z are jumpered together

X-U _____milliohms

Y-V _____milliohms

Z-W _____milliohms

Generator Exciter Field Winding Megger Test @ 500vdc

Temp_____ Humidity_____

FOR	0 sec			
	1 min			
	2 min			
	3 min			
	4 min			
	5 min			
	6 min			
	7 min			
	8 min			
	9 min			
	10 min			

Generator Amortisseur Windings To Gnd Megger Test

_____MEG OHMS

Generator Stator Megger Test @ 2500 VDC All Phases Shorted Together

Temp_____ Humidity_____

FOR	0 sec			
	1 min			
	2 min			
	3 min			
	4 min			
	5 min			
	6 min			
	7 min			
	8 min			
	9 min			
	10 min			

Pedestals Check To Ground	Fluke 77	_____ OHMS
	100VDC Megger	_____ OHMS

Generator exciter field winding pole winding voltage drop test using 10 amp Variac and voltage and current meters.

Total Voltage Applied To Rings (AC)= _____ volts (recommend (120vac)
total current= _____amps (approx. 10 amps)

Pole	Voltage Drop Across Pole (VAC)
6	
5	
4	
3	
2	
1	

Generator exciter field winding pole winding resistance plot Voltage vs. Current in increments of 10VAC

Voltage	Current
6	
5	
4	
3	
2	
1	